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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/079,003	02/20/2002	Peter Haug	1376-01	6145
35811	7590	04/14/2004	EXAMINER	
IP DEPARTMENT OF PIPER RUDNICK LLP ONE LIBERTY PLACE, SUITE 4900 1650 MARKET ST PHILADELPHIA, PA 19103			ALEJANDRO, RAYMOND	
			ART UNIT	PAPER NUMBER
			1745	

DATE MAILED: 04/14/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/079,003	HAUG ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Raymond Alejandro	1745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 02 February 2004.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 February 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                                   | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)               | Paper No(s)/Mail Date. _____  |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>02/02/04</u> .  | 6) <input type="checkbox"/> Other: _____                                    |

## **DETAILED ACTION**

### ***Response to Amendment***

This action is in response to the amendment filed 02/02/04. The applicant has overcome the 35 USC 102 rejections. Refer to the abovementioned amendment for specific details on applicant's rebuttal arguments. However, the present claims are finally rejected over art as seen below and for the reasons of record:

### ***Information Disclosure Statement***

1. The information disclosure statement (IDS) submitted on 02/02/04 was considered by the examiner.

### ***Specification***

2. The amendment filed 02/02/04 is objected to under 35 U.S.C. 132 because it introduces new matter into the disclosure. 35 U.S.C. 132 states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows: (claims 1, 3 and 7) the recitation "*electrodeposited crystallites*" is not fully supported by the original disclosure. In that, it is noted that the specification as originally filed merely discloses, for example, "*crystallite size of the electrochemically deposited material*" (paragraph 0013); "*The electrochemical deposition*" (paragraph 0021 & 0025); "*surface treatment by electrochemical deposition*" (paragraph 0028). Thus, it is further contended that the original disclosure fails to clearly set forth and/or reveal the structure implied by the term "*electrodeposited crystallites*", in particular, the deposit formed in or at an electrode by electrolysis. In this regard, it is also stated that the specification is completely silent as to any

Art Unit: 1745

electrolytic deposition of material on a substrate. Accordingly, the specification, while being enabling for electrochemical deposition or coating of an active material on a substrate conductor, in general, does not reasonably provide enablement for the specific electrodeposited structure or electrodeposition technique as implied by the instant claim language.

Applicant is required to cancel the new matter in the reply to this Office Action.

***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claims 1-11 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The added material which is not supported by the original disclosure is as follows: (claims 1, 3 and 7) the recitation "*electrodeposited crystallites*" is not fully supported by the original disclosure. In that, it is noted that the specification as originally filed merely discloses, for example, "*crystallite size of the electrochemically deposited material*" (paragraph 0013); "*The electrochemical deposition*" (paragraph 0021 & 0025); "*surface treatment by electrochemical deposition*" (paragraph 0028). Thus, it is further contended that the original disclosure fails to clearly set forth and/or reveal the structure implied by the term "*electrodeposited crystallites*", in particular, the deposit formed in or at an electrode by electrolysis. In this regard, it is also stated that the specification is completely silent as to any

Art Unit: 1745

electrolytic deposition of material on a substrate. Accordingly, the specification, while being enabling, in general, for electrochemical deposition or coating of an active material on a substrate conductor, does not reasonably provide enablement for the specific electrodeposited structure or electrodeposition technique as implied by the instant claim language.

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

7. Claims 1-3 and 7-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bittihn et al 5047302 in view of Shokoohi et al 5110696.

The instant application is directed to a galvanic element wherein the disclosed inventive concept comprises the specific substrate having deposited a layer thereon. Other limitations include the conductor material; the electrochemically active material; the thickness of the

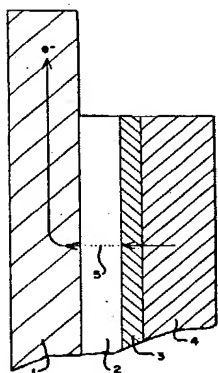
Art Unit: 1745

substrate and the crystallite size; the number of layers; the corrosion layer; and the laminated substrate.

Regarding claim 1:

In particular, Bittihn et al disclose a galvanic cell having at least one electrode with an active material comprised of a conductive organic polymer compound (*the electrochemically active material*) which is formed by electrochemical deposition on an oxide-free aluminum substrate (CLAIM 7); wherein the substrate is initially covered with a natural oxide film, and wherein the natural oxide film is removed from the substrate by pickling prior to the application of the polymer compound (CLAIM 8); wherein the substrate is coated with a heavy metal which is resistant to corrosion after the natural oxide film is removed from said substrate (CLAIM 9). It is disclosed that the heavy metal coating can first be applied galvanically (COL 4, lines 15-20). Bittihn et al disclose that the oxide-free substrate is provided with a heavy metal coating (CLAIM 13); and the aluminum substrate is a foil material (CLAIM 11 & CLAIM 5).

The Figure below illustrate the aluminum metal layer 1, the natural oxide covering 2, the electron-conducting coating 3 (*it is noted that Bittihn et al also embody removing the natural oxide layer so as to have the heavy metal coating layer 3 directly deposited on the substrate layer 1*); and the electrochemically deposited polymer layer 4.



Art Unit: 1745

Examiner's note: with respect to the function or property "of enlarging contact area of the element and reducing contact resistance to the active material" is an inherent characteristic, function or property of the material. Accordingly, products of identical chemical composition can not have mutually exclusive properties, and thus, the foregoing claimed property, is necessarily present in the prior art material.

Regarding claim 2:

It is disclosed that the substrate is made from aluminum (CLAIMS 1 and 5).

Regarding claim 3:

It is disclosed that the electrode coating is made from a metal selected from the group consisting of at least Ni, Cr or Cr-Ni alloy (CLAIM 2).

Regarding claims 7-8:

It is disclosed that the electrode comprises of multi-layer structure having at least one layer formed of a heavy metal (CLAIM 1 and 9). *It is also noted that the electrode multilayer structure includes at least 1 layer too.*

Regarding claim 9:

Bittihn et al makes known that the substrate is coated with a heavy metal which is resistant to corrosion wherein the corrosion resistant heavy metal is chromium, a chromium-nickel alloy or a precious metal (CLAIM 9-10). *As to the method limitation, i.e. by immersion or the implication of the language "chromatization" per se, it is noted that a method limitation incorporated into a product claim does not patentable distinguish the product because what is given patentably consideration is the product itself and not the manner in which the product was made. Therefore, the patentability of a product is independent of how it was made.*

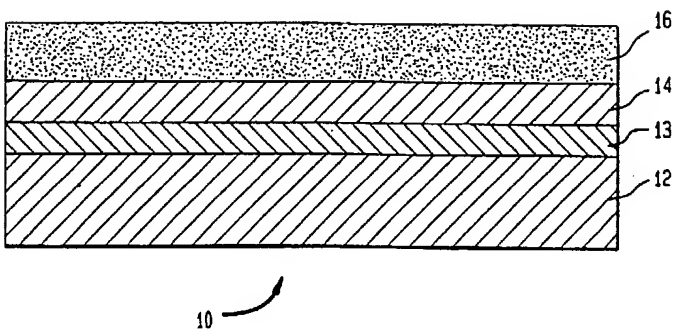
Art Unit: 1745

Regarding claim 10:

Bittihn et al also disclose the lamination-type electrode comprising a substrate foil laminated with an active material (CLAIM 1).

Bittihn et al disclose a galvanic element according to the foregoing. However, Bittihn et al does not expressly disclose the formation of electrodeposited crystallites.

Shokoohi et al disclose a thin film electrode (*the galvanic element*) prepared by electron beam deposition of an active material on a substrate surface and in situ annealing of the deposited active material wherein the nature of the substrate surface prevents epitaxial growth or ordered orientation of the composition crystallites formed therein (ABSTRACT). Shokoohi et al further teach that a thin film of titanium (Ti) ground layer 13 (*the second metal layer deposited thereon*) is useful to ensure effective bonding wherein the layer may be applied with conventional thermal or electron beam evaporation or sputtering techniques in preparation for deposition of the lithiated thin film intercalation layer 16 (COL 4, lines 52-59). It is disclosed that the substrate can be made of aluminum (COL 4, lines 34-39). *Thus, Shokoohi et al envision the deposition of second metal crystallites on the aluminum substrate 12.*

**FIG. 1**



Art Unit: 1745

In light of these disclosures, it would have been obvious to one skilled in the art at the time the invention was made to form the electrodeposited crystallites of Shokoohi et al in the galvanic element of Bittihn et al because Shokoohi et al teach that such metal crystallite formed on the aluminum substrate results in finely granular structure in the electrode film (the galvanic element) presenting abundant surface area that enables batteries to provide enhanced current densities. *Furthermore, the examiner wishes to point out that the crystallite structure deposited on the substrate of the prior art performs exactly the identical function specified in the instant claim in substantially the same way, therefore, the prior art element/feature is a structural equivalent of the corresponding element/feature claimed in the instant invention.*

Moreover, it is also noted that Shokoohi et al teach a galvanic element (the intercalation electrode) comprising a substrate having several layers deposited thereon. Thus, Shokoohi et al does clearly encompass the use of galvanic elements made of a multilayer metallic substrate and having the claimed second metal crystallite deposited thereon regardless. In this manner, the examiner impartially upholds and remarks that the two cited references (i.e. Bittihn et al and Shokoohi et al) share the same field of applicant's endeavor or, at least, they are reasonably pertinent to one another as they both address the particular problem with which the inventor is concerned. *As a consequence, in the absence of any specific definition of what is intended by the recitation "a galvanic element", it is thus contended that any feature relating to or producing a direct current of electricity or able to conduct electricity is found to be relevant to the foregoing claimed invention as such feature meets the necessary functional interrelationship to satisfy the galvanic requirement.*

Art Unit: 1745

8. Claims 4-6 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bittihn et al 5047302 in view of Shokoohi et al 5110696 as applied to claim 1 above, and further in view of Nakanishi et al US 2002/0142211.

Bittihn et al'302 and Shokoohi et al'696 are applied, argued and incorporated herein for the reasons above. However, the preceding prior art does not expressly disclose the specific size of the crystallites and the specific thickness of the metallic conductor.

Regarding claim 4 and 11:

**Table 1** and **Table 3** shows invention cells 1 and 12 wherein the thickness of the Ni layer is 0.02 mm (or 20  $\mu\text{m}$ ) (SECTION 0126 & 0128 or Table 1 and 3).

As for claims 5-6:

It is disclosed that the copper current collector has a thickness of 20  $\mu\text{m}$  (SECTION 0161, 0184).

*Examiner's note: it is noted that Nakanishi et al's teaching of having the negative electrode current collector comprising a plurality of layers has been interpreted to apply to both the coated current collector of the negative electrode and the current collector plate per se (i.e. the current collecting structure) as they both are made from substantially the same material and have also substantially similar functionality of collecting current therethrough.*

In view of the above, it would have been obvious to one skilled in the art at the time the invention was made to make the specific size of the crystallites and the specific thickness of the metallic conductor of both Bittihn et al'302 and Shokoohi et al'696 as taught by Nakanishi et al because Nakanishi et al teach such specific dimension provides suitable electrochemical contact, mechanical stability and structural conformity. *In this case, this disclosure is found to be within*

Art Unit: 1745

*the same field of endeavor of the preceding prior art and, thus, relevant to each other because Nakanishi et al is concerned with providing metallic galvanic elements (their current collectors) having a plurality of layers characterized by having different metal layers deposited one over another. As a consequence, in the absence of any specific definition of what is intended by the recitation "a galvanic element", it is thus contended that any feature relating to or producing a direct current of electricity or able to conduct electricity is found to be relevant to the foregoing claimed invention as such feature meets the necessary functional interrelationship to satisfy the galvanic requirement.*

#### ***Response to Arguments***

9. Applicant's arguments, see the amendments filed 02/0204 for specific details, with respect to the rejection(s) of claim(s) 1-10 under the 35 USC 102 statute have been fully considered and are persuasive. Therefore, the rejection has been overcome. However, upon further consideration, a new ground(s) of rejection is made as seen above. Accordingly, applicant's arguments with respect to claims 1-11 (including newly submitted claim 11) have been considered but are moot in view of the new ground(s) of rejection.

#### ***Conclusion***

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO

Art Unit: 1745

MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Raymond Alejandro whose telephone number is (571) 272-1282. The examiner can normally be reached on Monday-Thursday (8:00 am - 6:30 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick J. Ryan can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Raymond Alejandro  
Examiner  
Art Unit 1745

A handwritten signature in black ink, appearing to read 'RAM', with a long, sweeping horizontal line underneath.